

## **Andrew Dahir**

### **Texas A&M University-Commerce**

Bachelors of Science, Dual Math and Physics with minor in Astronomy

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Mentor(s): Misha Gubarev

Mentor Org: ZP12



### ***“Metrology of X-ray Optics for Astrophysical Applications”***

The study of X-rays has proved to be a valuable asset to the discovery and understanding of the origins of the universe. In order to view X-rays sources that are scattered throughout space, specialized optics must be used that reflect the X-rays at grazing angles, such as the optics on the Chandra telescope. These optics are a combination of parabolic and hyperbolic reflectors which reflect incident X-rays to a common focus. Like everything in life, the angular resolution of the optics can be improved. One method is called differential deposition, which corrects manufacturing error through coating different thickness of a filler material to smooth a surface. In this study, we investigated how the filled optical performance was affected by the stress of the deposited layer. We utilized mathematical models of the ideal parabolic and hyperbolic optics to calculate the Wolter geometries. As the models replicate ideal optical performance, stress values were added to the Wolter prescription to examine the kinds of errors incurred in optical performance. Different coatings of the optics were tested to determine the effect of each coating on the radius of curvature of the ideal optics.

### **Research and Experience**

- **Honors Undergraduate Thesis**, Texas A&M University-Commerce (Jan 2010-Current)
  - "Interstellar Navigation By Pulsars"
  - Research and develop methodology and equations for using pulsars to navigate and locate a spacecraft in the universe
- **Assistant, Planetarium at Texas A&M University-Commerce**, Commerce, TX (Mar 2012-Current)
  - Mixed mud for brick layers and insured working area was kept clean and free of debris while following all OSHA safety requirements.
  - Summer employment provided partial tuition funding for fall 2008 semester
- **Assistant Manager and Stand-In General Manager at Dominos Pizza**, TX (Feb 2010-Current)
  - Fill in at any store where there is no General Manager or the General Manager is on vacation
  - Oversee day to day activities
- **PC Technician**, Wylie ISD and Texas A&M University-Commerce (Apr 2006-Sept 2009)
  - Troubleshoot and repair damaged computers
  - Develop and Implement new processes and software.

### **Memberships and Activities**

- Society of Physics Student (SPS), Aug 2011 – Current, Member
- The Climbing Society at Texas A&M University-Commerce Mar 2012-Current
  - Founder and President, Mar 2012-Current
  - Assistant Coach, Mar 2012-Current
  - Competitive Team Member

### **Honors, Awards**

- Honors Program at Texas A&M University-Commerce
- Dean's list For college of Science Engineering and Agriculture (Jan 2011 - Dec 2011)